

Transforming a Long-Term Acute Care Hospital into a COVID-19–Designated Hospital

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HEALTHCARE SYSTEMS are bracing for impact as the acute and post-acute care needs of patients with COVID-19 infection surge. The healthcare workforce is impacted simultaneously by the exposure risk of the pandemic, furloughs and lay-offs as hospitals have canceled elective procedures, and additional burdens of childcare or caring for sick loved ones at home. Predictions vary, but even conservative estimates overwhelm current hospital bed and resource capacity [1,2]. Although measures have been taken to limit elective procedures and reduce current hospital occupancy, there remains a core of non-pandemic-related patients to treat [3]. These patients will need to be protected from nosocomial COVID-19 transmission while emergency or time-sensitive healthcare is provided. Therefore, many hospitals are cohorting COVID-19 patients to specific units, converting operating rooms for critically ill COVID-19 patients, and creating triage structures away from emergency rooms [3–5]. Recommendations to cohort COVID-19 patients have been made by the Centers for Disease Control and Prevention, the World Health Organization, and frontline providers in Italy and China [5–8].

M Health Fairview is a hospital and clinic system that is a joint clinical enterprise between the University of Minnesota, University of Minnesota Physicians, and Fairview. Bethesda Hospital, a long-term acute care hospital (LTACH) in the system, experienced a decrease in patient volume in response to federal payment changes. Early planning identified Bethesda Hospital as a location for both surge capacity and to cohort COVID-19 patients. The decision to go was made on March 13 by the system leadership under an Incident Command structure. The aim of cohorting first and foremost is to reduce spread of the virus to healthcare providers and patients. The consolidation of patients also allows for specialization of the workforce, development and refinement of clinical protocols, and efficient implementation of research; all of which can improve patient outcomes and promote effective and conserved personal protective equipment (PPE) use [8,9]. Because the “usual work” at Bethesda Hospital does not include emergency, obstetric, or operative services, fewer services had to be suspended. Finally, the cohorting may allow the non-COVID-19 hospitals

to work at greater capacity for non-elective cases or other care, increasing access for patients and helping to keep the healthcare system financially viable.

As an LTACH, Bethesda Hospital provided care for chronic critical illness and prolonged complex care (including ventilator management) for as many as 50 patients. Typical daily ventilator census was between 12 to 18. None of the critical care rooms had a full range of typical intensive care unit (ICU) monitoring prior to conversion. To convert Bethesda hospital, the existing 46 LTACH patients were assessed and triaged to three discharge destinations. Engineers reconfigured the physical space and infrastructure to create 35 full-range ICU beds with negative airflow capability by replacing window panes and connecting HEPA-filter fans via conduit to the replaced windows. Additional modifications included wiring rooms for cardiac telemetry capabilities, and re-wiring the electrical systems to accommodate C-arms for extra-corporeal membrane oxygenation cannulation. Previous interventional radiology and procedure rooms were restored to functional states after decades of repurposed use. Fifty-five additional med-surg-type rooms were uniformly equipped to care for patients with acute respiratory disorders. The costs of infrastructure and technology changes were borne by the Joint Clinical Enterprise.

Next, volunteers across the M Health Fairview system stepped forward to staff this facility with in-house presence of hospitalists, intensivists, and certified nurse anesthetists assured. The nursing staff was created from existing Bethesda Hospital nurses, internal M Health Fairview hospital nurses, and external (traveling nurse agencies) sources with special considerations for licensing accommodated by the state of Minnesota. Respiratory therapy staffing continues to increase to match acuity and patient type. Employees who met symptom criteria or who had known exposures were tested. Specialty consultant availability was built from across the other academic and community sites, with remote consultation used as possible. The predominately accessed specialties included nephrology, cardiology, pulmonology, gastroenterology, all surgical specialties, infectious diseases, endocrinology, palliative medicine, physical and rehabilitation medicine, and neurology. The number of credentialed and trained

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providers continues to ramp up as the inpatient census increases. Executive medical directors of the critical care and hospitalist domains oversee staffing and privileging, with many providers already having system credentialing for ICU telemedicine (teleICU) prior to the pandemic. Of relevance to the *Surgical Infections* reader, a third of our intensivists deployed at Bethesda are surgeons, and many members of the incident command team leading disaster planning also are surgeons. The specialized skill sets of surgical intensivists and trauma surgeons have significant relevance in both disaster planning and incident command situations.

Laboratory, pharmacy, and radiology services were increased to provide 24/7 service. Additional system support services have increased critical capacity in areas such as information technology (electronic records, paging systems, badge access), supplies (especially PPE, respiratory equipment), and nutrition. The system operations center has developed new workflows to assist in patient triage and transfer across the system and management of select patients from other facilities. This included a newly built tool within M Health Fairview's electronic health record to identify patients who might require transfer. The clinical protocols for caring for these patients were developed and implemented by a multidisciplinary team, and these will be refined continually and updated as new evidence emerges.

Cohorting allows for increased efficiency in PPE use through increased telecommunication with patients and specialization of staff, and ease of conducting COVID-19-related research. As Bethesda-COV started accepting patients, each room was fitted with iPad technology to facilitate communication between patients and their loved ones. The equipment also was used to expand teleICU capability and to preserve PPE as staff could communicate with patients about their needs before donning PPE. Other measures to preserve PPE have included rationing of masks, reusing and sterilizing masks, as well as reusing gowns. We plan to have more specialized PPE training and consider alternative usage training for employees at Bethesda-COV should we have worsening shortages. Also, as the University of Minnesota is participating in three multi-center clinical trials, the main university hospital was approved as the primary study site. The National Institutes of Health showed great understanding and flexibility by providing a waiver for enrollment at this designated COVID-19 site. Within one week of opening, there were at least four research studies active or under preparation at Bethesda-COV.

This designated COVID-19 hospital started accepting patients March 26. During the first several weeks, patients were pulled from other facilities within M Health Fairview by the system operations center and transferred to Bethesda-COV. Some preliminary demographic and outcome data from Bethesda Hospital are included in Table 1. As Bethesda-COV has reached full occupancy and these patients have demonstrated prolonged intensive care requirements, we have expanded cohorting to include already identified hospitals within our system close to Bethesda-COV to take overflow patients [10]. We also have worked in concert with the state of Minnesota, which has set up a statewide triage center for critically ill COVID-19 patients. The next steps are to create facilities for lower-acuity patients and to provide post-acute care to COVID-19 patients, as these

TABLE 1. PRELIMINARY DEMOGRAPHIC AND OUTCOMES DATA FROM BETHESDA HOSPITAL TO DATE

Characteristic	Hospitalized floor patients (n = 149)	Intensive care unit patients (n = 138)
Median age (IQR)	69 (51 –83)	64 (54 –77)
Race (%)		
White	94 (66)	53 (42)
Black	21 (15)	25 (20)
Asian	16 (11)	28 (22)
Hispanic	0 (0)	1 (1)
Declined	1 (1)	6 (5)
Other	10 (7)	12 (10)
Male sex (%)	79 (53)	56 (41)
Median total hospital days (IQR)	7.7 (4.0–11.9)	8.6 (1.3–14.7)
Median ventilator days (IQR)	0	5.2 (1.5–14.7)
Median ICU-free days (IQR) ^a	30 (30 –30)	17.2 (3.4–28.3)
Death (%) ^b	10 (7)	36 (26)

^aNumber of days in the last 30-day period that the patient was alive and outside of the ICU.

^bDeath includes both inpatient and death records after discharge. IQR = interquartile range. ICU = intensive care unit.

facilities in our region are demanding demonstration of viral clearance prior to accepting new patients into highly vulnerable settings [11,12]. Testing continues to be a significant issue, requiring that it be limited to symptomatic healthcare workers, hospitalized patients, residents of long-term transitional care or assisted-living facilities, and patients who require dialysis, infusions, or hospice care or are transplant candidates. We hope to be able to expand testing capabilities to include periodic screening to capture asymptomatic providers in the future.

Bethesda-COV continues to evolve as patient needs change, and we are committed as a system to continuing to cohort COVID-19 patients whenever possible. Other systems, such as Steward Health, have opened similar “Dedicated Care Centers” for COVID-19-positive patients in Dorchester, Massachusetts. A recent *Health Affairs* article called for designation of select institutions as COVID-19 referral centers for specific geographic regions [3]. To reduce waste from fragmentation in the system and limit healthcare provider exposures associated with multiple individual hospitals preparing to tackle COVID-19, we add our voice to the call for more centralized specialized care of these patients when possible. These designated sites allow rapid-cycling learning and improvement in the midst of this emerging crisis.

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